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POLISHES

In response to numerous requests from the public for information on various polishes and floor waxes, the following data have been collected. Numerous patents have been granted covering such preparations. Abstracts of such patents issued during the past 20 years will be found in Chemical Abstracts, published by the American Chemical Society and available in public libraries.

Furniture and Automobile Polish

Polishes that are suitable for furniture can be used on automobiles also, provided the finishes are of the same type and in practically the same condition. Varnish, ordinary enamel, cellulose ester (lacquer), and baked enamel finishes are the surfaces that are generally encountered. There are differences in the hardness of finishes, the fastness of colors, and the resistance to solvents and abrasives.

Furniture and automobile polishes should remove dirt and grease readily from the surfaces, restore their luster, and be nearly completely removable, so as not to leave the surface in such condition as to hold dust nor to leave any objectionable odor. Such polishes should contain no alkali or alkaline compound that will attack finishes; emulsions should be stable or constant; the nature and amount of solvents and oils used

should be duly considered, e.g., alcohol, benzol and other solvents may seriously attack cellulose ester (lacquer) finishes. Nitrobenzene (nitrobenzol or "oil of mirbane") should not be used to impart odor to polishes as its vapors are toxic.

A. Classes of Polishes

(1) Oil Polishes.- Most of the straight oil polishes consist in whole, or mainly, of a mineral oil. Mineral oil polishes are cheap, do not oxidize, and give a glossy polish if rubbed off thoroughly. Mixtures of mineral oil (paraffin oil) and linseed oil, usually with other ingredients, are also used. Linseed oil is used as a component of many polishes for varnished surfaces. Polishes containing it or other drying oil should be rubbed off thoroughly from the surface being polished.

(2) Wax polishes are made in paste and liquid form. Some of the emulsion polishes contain some wax, usually beeswax. Although beeswax is used in many polishes, the harder waxes with higher melting points, such as carnauba wax, are to be preferred. Some of the wax polishes soften at fairly low temperatures and may whiten by long contact with water. Polishes showing these properties would be more satisfactory on furniture than on automobiles.

(3) Special Mixtures.- Most of the commercial polishes probably fall under this heading. These polishes may consist of mixtures of oils, waxes, volatile solvents, abrasives, acetic acid (or vinegar), antimony trichloride ("butter of antimony"), camphor, drier, etc. Alkanet root and oil-soluble dyes are

sometimes used to impart a red or other color to such polishes. Essential oils are sometimes added to impart a pleasant odor or to mask the odor of certain components. Many of these polishes are sold in the form of emulsions.

The abrasive used in making a polish, or a combined polish and surface cleanser, should be selected with care in order not to scratch or otherwise mar the finishes on which the polish may be used. Pumice, tripoli, diatomaceous earth (infusorial earth, tripolite, diatomite, kieselguhr, etc.), chalk and silica are some of the commonly used abrasives. The abrasive should be a uniform and very finely-powdered product. Very fine abrasives are apparently used in small amounts in the preparation of some polishes for cellulose ester (lacquer) finishes. The polishes for varnish and ordinary enamel coatings as a rule do not contain any abrasive, as these finishes may be readily marred by abrasives.

B. Formulas.

The Bureau of Standards has not developed formulas for furniture and automobile polishes, but the following are said to be satisfactory for use on the ordinary varnish and enamel finishes. In making up polishes care should be taken to have no flames around, as gasoline, turpentine, petroleum spirits, etc., are highly flammable.

(a) Formula developed by the Bureau of Construction and Repair, Navy Department, and recommended by the Federal Specifications Board for the use of the various Departments and Independent Establishments of the Government:

Material	Pounds
Cider vinegar	125
Petroleum spirits	336
Turpentine	135
Denatured alcohol	22
Boiled Linseed oil	100
Raw linseed oil	121

The quantities given above are sufficient to make 100 gallons of the polish. Polishes containing acetic acid (vinegar) should not be put in metal containers.

(b) Raw linseed oil . . . . . 1 pint

Turpentine . . . . . 3 pints

Beeswax . . . . . 1 to 2 ounces

Dissolve the beeswax in the linseed oil by heating slightly, remove from the source of heat, add the turpentine and mix. Shake well before applying.

(c) A straight mineral oil, neutral in reaction; such as transformer oil or paraffin oil.

(d) Mix 1 pint of linseed oil, 3 pints of water and 1 pint of denatured alcohol. Shake well before applying.

(e) Emulsion polishes similar to the following have been used on cellulose ester (lacquer) finishes:

Material	Parts by weight
Mineral spirits or gasoline . . .	44 to 44.5
A mixture of beeswax and carnauba wax	9
Finely-powdered diatomaceous earth or tripoli (at least 335 mesh)	2
Water	44
Neutral soap	0.5 to 1

Dissolve the waxes in the gasoline by warming in hot water; add the abrasive to this solution and mix by stirring or shaking; dissolve the soap in the water; add the soap solution to the gasoline mixture, and shake thoroughly. The soap solution should be just warm enough to remain liquid so that the gasoline will not boil out of the vessel. Shake well before applying. This type of polish should be used with care to avoid marring the finish by too vigorous rubbing. Polishes which contain no abrasives are also in use for cellulose ester coatings. The formula listed, or a modification of it, might be tried, omitting the diatomaceous earth or tripoli.

Metal Polish

Although polishing powders are in use, metal polishes usually consist of some abrasive material in suspension in a liquid or semiliquid vehicle. The principal difference in composition between the paste and liquid polishes is in the vehicle employed. The abrasive materials should possess such hardness, fineness, and shape of particles as will best accomplish the desired polishing without scratching. Metal polishes

should not contain mineral acids or other materials that may have an injurious effect on metals. They should not contain cyanides or nitrobenzene, and should be free from disagreeable odor. Obviously, a finer grade of abrasive, such as rouge (oxide of iron) or precipitated chalk (calcium carbonate) is required for highly polished surfaces than for relatively dull surfaces, such as kitchen utensils, in which latter case various siliceous materials are generally employed. The vehicle in the pastes is usually a petroleum product (heavy mineral oil, vaseline, paraffin, etc.) or a fatty product (stearin, tallow, stearic acid, oleic acid, etc.) or both, to which soap and other materials (e.g., oxalic acid, cream of tartar, etc.) are sometimes added. Pine oil is also a common and valuable solvent in soap-base metal polishes. It gives body and helps hold the abrasive matter in suspension. The non-flammable liquid polishes usually have as a vehicle water containing soap with kerosene and ammonia or a mixture of kerosene or other petroleum distillate with sufficient carbon tetrachloride to render the mixture non-flammable. The flammable polishes usually contain gasoline, kerosene or other petroleum distillate. As a rule, the liquid polishes are more efficient where much tarnish is to be removed, but they should be used with care if they contain flammable constituents. The paste and liquid polishes sometimes contain essential oils to mask the odor of certain ingredients.

Polishing powders may be a single substance, such as rouge or chalk, or a mixture of various abrasives with or without added materials. On plated ware, such as nickel plate, silver plate, etc., only the mildest abrasives should be employed

because of the thin coatings commonly used. Precipitated chalk, rouge, powdered talc, or other finely-powdered abrasive, free from hard or gritty particles, would probably be the safest abrasive to use. The "electrolytic cleaning" of silver is described and discussed in papers by members of the Bureau of Standards staff, published in Metal Industry (New York), January, March, April and June, 1924.

Groggins and Scholl have recommended orthodichlorobenzene as a cleaner for metals and as a component of metal cleaners. A paste prepared by mixing one part of precipitated chalk with five parts of orthodichlorobenzene and applied with a cloth is said to be very effective for cleaning and polishing silverware and other metals in the home and for removing rain spots from nickel-plated automobile radiator shells. The compound may be mixed with other abrasives as absorbents to yield polishing pastes. Table utensils polished with such products should be dipped into boiling water before they are used again.

Floor Polish

Floor polishes may be roughly classified as pastes (the so-called floor waxes) and liquids (suspensions or emulsions), frequently called "liquid floor waxes". The former usually consist of beeswax, carnauba, ceresin, or a mixture of these together with turpentine, volatile mineral oil, ammonia, etc., to produce the desired consistency. The liquid polishes, which are easier of application, usually contain the same materials as the pastes but have a larger proportion of turpentine or mineral oil.

In addition, they may contain water, limewater, potassium carbonate, etc.

The following formulas, given in Bureau of Standards Circular No.70, furnish good floor waxes or paste polishes:

In making either of the following waxes be very careful to heat only by setting the vessel containing the waxes in hot water and to have no flames in the room, since both gasoline and turpentine are very flammable.

(1) Material	Parts by weight
Carnauba wax	2
Ceresin	2
Turpentine	3
Gasoline (sp.gr.about 0.73)	3

Melt the waxes by heating in a vessel placed in hot water, add the turpentine and gasoline and cool the mixture as rapidly as possible, while vigorously stirring to produce a smooth creamy wax.

(2)	
Turpentine	1 pint
Beeswax	4 ounces
Aqua ammonia (10 per cent strength)	3 ounces
Water	about 1 pint

Mix the beeswax and turpentine and heat them by placing the vessel in hot water until the beeswax dissolves. Remove the mixture from the source of heat, add the ammonia and the water, and stir vigorously until the mass becomes creamy. This wax should be applied lightly on varnished or shellacked floors

and any excess wiped off at once, as the ammonia may attack the varnish or shellac. When this wax is used on unfinished oak flooring, the ammonia may cause a slight darkening of the wood.

Floor wax should be applied in very thin coats and thoroughly rubbed with a heavy waxing brush or a heavy block wrapped in burlap or carpet. In preparing a new or refinished floor for waxing it is common practice to apply a coat of shellac varnish or other quick-drying varnish before waxing. If this is done it is better to have a very thin coating of shellac as thicker coatings are apt in time to crack or peel, which will necessitate complete refinishing. The wax can be applied directly to close-grained woods such as maple or pine, or to such open-grained wood as oak, if a silicate filler is first applied. This treatment requires more waxing, and therefore more labor, in the original job but the finish is likely to be more durable. However, floors finished in this way will probably darken more with time than if the wax is applied over a thin coat of shellac.

Glass Polish

Polishes for glass are generally powders or pastes. Precipitated chalk, calcined magnesia, crocus or rouge (iron oxide), "putty powder" (tin oxide), and fine siliceous materials are the abrasives usually employed. In addition, they frequently contain soap, sodium carbonate, trisodium phosphate, ammonium compounds (or ammonia), for the purpose of removing grease, etc.

Stove Polish

Stove polishes may be obtained as powders, so-called liquids, pastes, and sticks or cakes. Graphite is usually the basic ingredient. Finely powdered graphite may be used directly as a stove polish after mixing with a little water. Lampblack, carbon black, and bone black are sometimes added to deepen the color, but these forms of carbon are more readily burned off than graphite. Nigrosine (a black aniline dye) has also been used to deepen the color of such polishes. Stove polishes may contain, in addition to graphite and other forms of carbon, such materials as: copperas (ferrous sulphate), soap, "water glass" (sodium silicate), waxes, gums, sugar, glycerin, water, oils, turpentine, etc. Turpentine or other readily flammable liquid should not be used in such polishes. The liquid polishes are generally of two types: (a) graphite suspended in a water solution of sodium silicate, soap, etc., and (b) a suspension of graphite in a petroleum distillate (oil) mixture or such a mixture with the addition of carbon tetrachloride to render it non-flammable.

Shoe Polish

The ordinary black shoe polishes generally contain wax (beeswax or carnauba wax), nigrosine (a black dye), sodium or potassium carbonate solution, soap, turpentine, etc. After the wax has been emulsified by boiling in the soda (or potash) solution (a solution of borax may also be used), the emulsion is mixed with a hot aqueous solution of ordinary laundry soap

and sufficient nigrosine to give the desired depth of color. This cools to a soft paste. If the liquid form is desired, a good grade of castile soap (pure olive oil-soda soap) or a soft (potash) soap may be substituted for the laundry soap. Another method is to dissolve carnauba wax or candelilla wax or a mixture of the two with beeswax and ceresin or paraffin in hot turpentine and mix with very finely pulverized bone charcoal. Tallow, lard, neats-foot oil, spermaceti, rosin, gums, and various other materials have been used in making shoe polishes.

Brown shoe polishes consist of such substances as soft soap, wax, glycerin, linseed oil, turpentine, shellac, etc., to which is added some dye; i.e., annatto, aniline yellow, etc. The following formulas and information have been furnished by a manufacturer:

(1) Cleaner for such leathers as Russia calf, black or tan vici, and white kid.

Dissolve 8 ounces of granulated castile soap in one gallon of hot, soft water, add 3 1/2 gallons of warm, soft water, cool, add 16 ounces of ethyl ether, and mix.

(2) Patent leather cleaner.

Dissolve 4 ounces of granulated castile soap in one gallon of hot, soft water, cool, add 2 quarts of denatured alcohol and then 16 ounces of ammonia water (sp.gr. 0.90), mix.

(3) Water polish or dressing.

Dissolve 1 part by weight of castile soap in 16 parts of clean, soft water, and heat the solution to boiling. Add to the boiling soap solution with constant stirring 4 parts by weight of a good grade of carnauba wax or other suitable wax, as Japan wax or beeswax (cut into small pieces). When a smooth homogeneous emulsion is obtained, cool to a temperature of 135°F. by quickly adding, with constant stirring, the necessary quantity of cold water. (This should take about 14 to 16 parts more of water). Let cool, filter through cheese-cloth, and stir in about 0.5 per cent of formaldehyde as a preservative. The product so obtained should be of the color and consistency of cream. A thicker or thinner product may be made by decreasing or increasing the quantity of water used, taking care to maintain the given ratio between soap and wax. The polish may be colored by thoroughly stirring in a strong solution of a suitable water-soluble dye; e.g., for a black polish, add a solution of one part of nigrosine dissolved in 12 parts of water.

(4) Oil polishes.-

Many of the formulas for an oil polish, such as the turpentine paste polishes, do not include soap at all, being made up of a wax base and a small amount of other materials with about 75 per cent of turpentine. Some of the firm paste polishes are made with a small amount of soap, beeswax, ceresin and carnauba wax, with about 75 per cent of turpentine.

Polishing Cloths

Cloths used for polishing furniture may be of cotton, wool or silk. Some firms use cheesecloth and others use a wool cloth made specially for the purpose. Cheesecloth is probably the easiest to obtain since it is not made specially for polishing, and is the most economical. Wool and silk cloths are more expensive and when made for polishing furniture are usually woven so as to be soft and non-abrasive.

Polishing cloths or rags intended primarily for use on metals usually consist of woolen fabrics which have been saturated with fatty oil, mineral oil, or paraffin, or mixtures of these, containing in suspension a very finely powdered abrasive, such as tripoli or infusorial earth. Fatty acids have been used with paraffin in the preparation of such cloths, but such acids may cause corrosion on some metals if a film of the acid remains. Muslin rags are also in use. Suspensions of tripoli (or other abrasive) in soap solutions, or mixtures of soap solutions, pine oil, ammonia, etc., have also been used for preparing polishing cloths. Some of these mixtures are colored with dyes and may contain a little essential oil. A polishing cloth might be prepared as follows: Dissolve a fatty oil (such as cottonseed oil), mineral oil (transformer oil or paraffin oil), or paraffin in gasoline, add the abrasive and mix thoroughly, pass the cloth through the suspension, and then stretch the cloth and allow to dry in this condition.

If a vegetable oil (cottonseed, linseed, etc.) is used on wool, dry in a good circulation of air in a cool place not exposed to direct sunlight, in order to avoid danger of spontaneous combustion.

Dust Cloth, Oiled.

These cloths are commonly referred to as "dust-less dust cloths". Such cloths may be made by saturating a fabric with kerosene, hanging up to allow the more volatile part to evaporate, and then rubbing the oiled cloth on a wooden surface until it no longer streaks. These cloths may also be made by saturating them with a gasoline solution of paraffin, paraffin oil, linseed oil, or rapeseed oil, or a mixture of these, wringing out, and drying at room temperature. Sometimes essential oils or certain resins are added to the impregnating mixture.

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